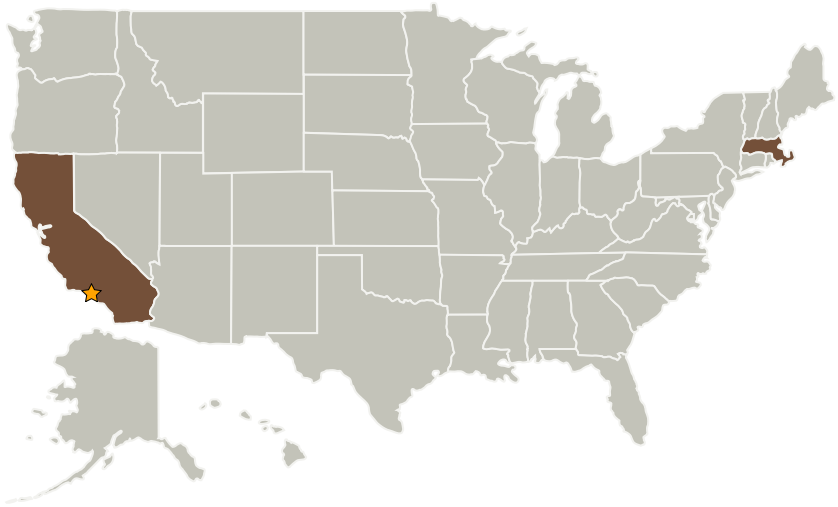
Ultra-Lightweight Cryogenic Active Mirror Technology, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

Xinetics is poised to support NASA in answering questions such as: When and how did the first stars form and what is the history of galaxy evolution and energy/element production in the universe? We will contribute by developing an Ultra-Lightweight Large Aperture Cryogenic Active Mirror (Ultra-CAM) technology that operates near 5 K. The Ultra-CAM design will provide an active, lightweight, stiff, large aperture mirror substrate to collect infrared (IR), far-IR and submillimeter (sub-mm) radiation from a space observatory. Since the Earth?s atmosphere absorbs this part of the electromagnetic spectrum, far-IR and sub-mm wavelengths must be studied in space and at cryogenic temperatures. These spectrums hold the key to answering these questions. To avoid radiation noise from the telescope, the telescope including the primary mirror must be maintained near 5 K. Xinetics? SiC and cryogenic actuator technologies have been performance tested and proven at cryogenic temperatures previously. Since NASA is planning missions such as the Single Aperture Far-IR telescope (SAFIR) that will require deployable large aperture optics that operate near 5 K, Xinetics intends to develop the Ultra-CAM mirror technology necessary to achieve NASA?s future mission goals for programs such as SAFIR.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Xinetics, Inc.	Supporting Organization	Industry	Devens, Massachusetts

Primary U.S. Work Locations	
California	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Maureen Mulvihill

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.2 Observatories
    - TX08.2.1 Mirror Systems